

CLAIMS

1. A semiconductor light emitting device having a luminous layer, comprising:
 - 5 a light transmission layer disposed over a main surface of the luminous layer, and having depressions on a surface facing away from the luminous layer; and
 - a transmission membrane disposed on the light transmission layer so as to follow contours of the depressions,
- 10 wherein

light from the luminous layer is irradiated so as to pass through the light transmission layer and the transmission membrane.
- 15 2. A semiconductor light emitting device according to Claim 1, wherein a surface of the membrane facing away from the light transmission layer is substantially flat.
- 20 3. A semiconductor light emitting device according to Claim 1, wherein a main component of the membrane is one of polyimide, epoxy, and silicone.
4. A semiconductor light emitting device according to Claim 1, wherein a main component of the membrane is glass.
- 25 5. A semiconductor light emitting device according to Claim 1, wherein the membrane contains a luminous substance that

is excitable by the light from the luminous layer.

6. A semiconductor light emitting device according to Claim 5, wherein the light from the luminous layer is converted 5 into white light by passing through the membrane.

7. A semiconductor light emitting device according to Claim 5, irradiating white light generated by light from the luminous substance being excited mixing with the light from the luminous 10 layer.

8. A semiconductor light emitting device according to Claim 1, wherein the depressions are at an interval equal to or greater than $\lambda/4$, λ being a wavelength of the light from the 15 luminous layer.

9. A semiconductor light emitting device according to Claim 1, wherein

the light transmission layer is formed from at least 20 a light transmission substrate, and

the luminous layer is sandwiched between a plurality of layers and is disposed over the light transmission substrate.

25 10. A semiconductor light emitting device according to Claim 9, wherein the depressions are on a main surface of the light transmission substrate facing away from the luminous layer.

11. A semiconductor light emitting device according to Claim 9, wherein the light transmission substrate is made of a material having a refractive index that is substantially equal to a refractive index of the luminous layer.

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12. A semiconductor light emitting device according to Claim 11, wherein the material for the light transmission substrate is selected from a group of GaN, SiC, and AlN.

10 13. A semiconductor light emitting device according to Claim 9, wherein a reflective film is disposed on a surface of the luminous layer facing away from the light transmission layer.

14. A semiconductor light emitting device according to Claim 15 1, being a light emitting diode device.

15. A semiconductor light emitting device according to Claim 1, being a Vertical Cavity Surface Emitting Laser device.

20 16. A semiconductor light emitting device according to Claim 1, being a Resonant Cavity Light Emitting Diode device.

17. A semiconductor light emitting device according to Claim 1, being a Surface Mount Device.

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18. A lighting apparatus comprising a mounting substrate, and a semiconductor light emitting device mounted on a pad

on a surface of the mounting substrate, wherein:

the semiconductor light emitting device includes;

a luminous layer;

5 a light transmission layer disposed over a main surface of the luminous layer, and having depressions on a surface facing away from the luminous layer; and

10 a transmission membrane disposed on the light transmission layer so as to follow contours of the depressions, and

15 light from the luminous layer is irradiated so as to pass through the light transmission layer and the transmission membrane.

19. A lighting apparatus according to Claim 18, wherein
15 a surface of the membrane facing away from the light transmission layer is substantially flat.

20. A lighting apparatus according to Claim 18, wherein
a main component of the membrane is glass.

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21. A display apparatus comprising a mounting substrate, and a plurality of semiconductor light emitting devices each mounted on a pad on a surface of the mounting substrate, wherein
each of the semiconductor light emitting devices
25 includes:

a luminous layer;

a light transmission layer disposed over a main surface

of the luminous layer, and having depressions on a surface facing away from the luminous layer; and

5 a transmission membrane disposed on the light transmission layer so as to follow contours of the depressions, and

light from the luminous layer is irradiated so as to pass through the light transmission layer and the transmission membrane.

10 22. A display apparatus according to Claim 21, wherein a surface of the membrane facing away from the light transmission layer is substantially flat.

15 23. A display apparatus according to Claim 21, wherein a main component of the membrane is glass.

24. A method of manufacturing a semiconductor light emitting device, comprising steps of:

20 forming a light transmission layer over a multi-layered body in which the luminous layer is sandwiched between a plurality of layers, the light transmission layer having depressions on a surface facing away from the luminous layer; and

25 forming a transmission membrane on the light transmission layer so as to follow contours of the depressions.

25. A method of manufacturing a semiconductor light emitting

device according to Claim 24, wherein a material that forms the membrane contains a luminous substance that is excitable by the light from the luminous layer.

5 26. A method of manufacturing a semiconductor light emitting device according to Claim 25, further comprising a step of: polishing the membrane after forming the membrane, till a thickness of the membrane becomes such that irradiated light is desirable white light.

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27. A method of manufacturing a semiconductor light emitting device according to Claim 24, wherein a material that forms the membrane contains one of polyimide, epoxy, and silicone.

15 28. A method of manufacturing a semiconductor light emitting device according to Claim 24, wherein a material that forms the membrane contains glass.

20 29. A method of manufacturing a semiconductor light emitting device according to Claim 24, wherein
the light transmission layer includes at least a light transmission substrate, and
the depressions are on a main surface of the light transmission substrate facing away from the luminous layer.

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30. A method of manufacturing a semiconductor light emitting device according to Claim 29, wherein the light transmission

substrate is formed by a material selected from a group of GaN, SiC, and AlN.